

# Guidelines for Core Population Coverage Indicators for Roll Back Malaria:

*To Be Obtained from Household Surveys*

July 2004



GUIDELINES FOR CORE POPULATION COVERAGE  
INDICATORS FOR ROLL BACK MALARIA:  
TO BE OBTAINED FROM HOUSEHOLD SURVEYS

ROLL BACK MALARIA  
MEASURE *Evaluation*  
WORLD HEALTH ORGANIZATION  
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## ACRONYMS

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AED	Academy for Educational Development
DHS	Demographic and Health Surveys
IPT	Intermittent preventive treatment
IRS	Indoor residual house-spraying
ITN	Insecticide-treated nets
M&E	Monitoring and evaluation
MICS	Multiple Indicator Cluster Surveys
MIS	Malaria Indicator Survey
NMCP	National malaria control program
RBM	Roll Back Malaria
SP	Sulphadoxine pyrimethamine
SSA	Sub-Saharan Africa
UN	United Nations
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
WHO	World Health Organization

# 1. INTRODUCTION

## 1.1 BACKGROUND

Malaria poses a tremendous public health problem across the globe with an estimated 40% of the world's population living in areas of malaria risk. An estimated 300–500 million malaria episodes and at least one million malaria deaths occur annually. While malaria is endemic within most tropical and subtropical regions of the world, 90% of all malaria deaths currently occur in sub-Saharan Africa (SSA). Young children and pregnant women represent those at greatest risk of malaria-related morbidity and mortality, especially in areas of stable transmission. It has recently been estimated that malaria is responsible for approximately 20% of all deaths among children less than 5 years of age in SSA, accounting for 90% of all malaria-related deaths globally. Malaria also places an enormous toll on the already overburdened health systems across SSA and elsewhere, as it has been estimated that malaria-related illnesses account for approximately 30% of all outpatient clinic visits within malaria-endemic countries of the SSA region [1, 2].

In an effort to combat the growing threat of malaria, the Roll Back Malaria (RBM) partnership was launched in 1998, with the goal of halving the burden of malaria by 2010. Combating malaria has been set as a high priority within the United Nations' (UN) Millennium Development Goals.<sup>1</sup> In May 2002, the strategies for protecting children and pregnant women from malaria were also adopted by the UN General Assembly's Special Session on Children (A World Fit For Children). The UN has also declared 2001–2010 the “Decade to Roll Back Malaria” in developing countries, particularly in Africa.<sup>2</sup> Moreover, heads of state from across Africa met in Abuja, Nigeria in 2000 to express their commitment to combating malaria. Specific targets for malaria control strategies were established as a result of the Abuja summit to coincide with specific technical strategies supported by RBM (Table 1).

**Table 1: RBM Technical Strategies and Abuja Targets**

<b>RBM Technical Strategies</b>	<b>Abuja Target (by 2005)</b>
Vector control via insecticide-treated nets (ITNs)	60% of those at risk for malaria, particularly children under 5 years of age and pregnant women, will benefit from a suitable combination of personal and community protective measures, such as ITNs.
Prompt access to effective treatment	60% of individuals suffering from malaria should have access to and be able to use correct, affordable, and appropriate treatment within 24 hours.
Prevention and control of malaria in pregnant women	60% of pregnant women at risk of malaria will be covered with a suitable combination of personal and community protective measures, such as ITNs.  60% of pregnant women at risk of malaria will have access to intermittent preventive treatment (IPT).

Adapted from the Africa Malaria Report 2003, WHO, 2003.

<sup>1</sup> UN General Assembly, 27<sup>th</sup> Special Session: Supplement 3, Doc A/S-27/19/Rev.1.

<sup>2</sup> UN General Assembly, Resolution 55/284.

It is recognized that an effective system for monitoring progress and evaluating results will be critical for assessing the success of the RBM technical strategies. Such data will be crucial for identifying areas where modifications in specific technical strategies may be needed, as well as where resources should be focused. To facilitate this process, the RBM partners have established a set of core indicators for population coverage that can be collected through household surveys that permit national-level monitoring of the technical strategies supported by RBM.

## 1.2 PURPOSE AND CONTENT OF MANUAL

The purpose of this manual is to provide country partners with technical guidance on the detailed specifications of the core indicators for population coverage that can be measured through household surveys, the data required for their construction, as well as issues related to their interpretation. Details of the data collection methods required for estimating these indicators through national-level household surveys are also provided. This manual is intended to maximize internal consistency and comparability of the indicators across countries and over time, and to ensure consistency in the types of data collection methods used.

This manual begins with a brief discussion on the basic principles of monitoring and evaluation. The core indicators for population coverage that will be used to measure the success of the RBM technical strategies of vector control via insecticide-treated nets (ITNs), prompt access to effective treatment, and prevention and control of malaria in pregnant women are then listed. A brief discussion on the rationale for these RBM technical strategies is also provided. Discussions on measurement tools, methods of measurement, interpretation, and reporting of the indicators are then provided. The manual concludes with detailed guidelines for constructing each indicator.

## 2. MONITORING AND EVALUATION

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Evaluation is the use of social or epidemiological research methods to assess, and ideally improve, the implementation of public health programs. The overall goal of monitoring and evaluation (M&E) is to measure program effectiveness. M&E may be focused on local initiatives as well as measuring program effectiveness at the national and regional levels. Ideally, M&E tools can be used to demonstrate to planners and other decision-makers that program efforts have had measurable impacts on the outcomes of interest. M&E can also provide insight as to where resources are being used most efficiently versus where new strategies should be considered.

Monitoring is used to verify step-by-step the progress of malaria control programs at various levels in order to verify whether activities have been implemented as planned, ensure accountability, detect problems and constraints related to the intervention activities, and promote evidence-based planning through timely feedback to the relevant authorities. Indicators of inputs, processes, and outputs are typically used for monitoring purposes at the program level. Input indicators are generally used to measure the level of resources available for use by the program or intervention, such as the funding obtained to purchase ITNs. Process indicators are generally used to verify that a program or intervention has been implemented as planned, such as verifying that ITNs have been purchased and are ready for distribution. It is expected that inputs and desired processes will lead to desired changes in output indicators, which are generally used

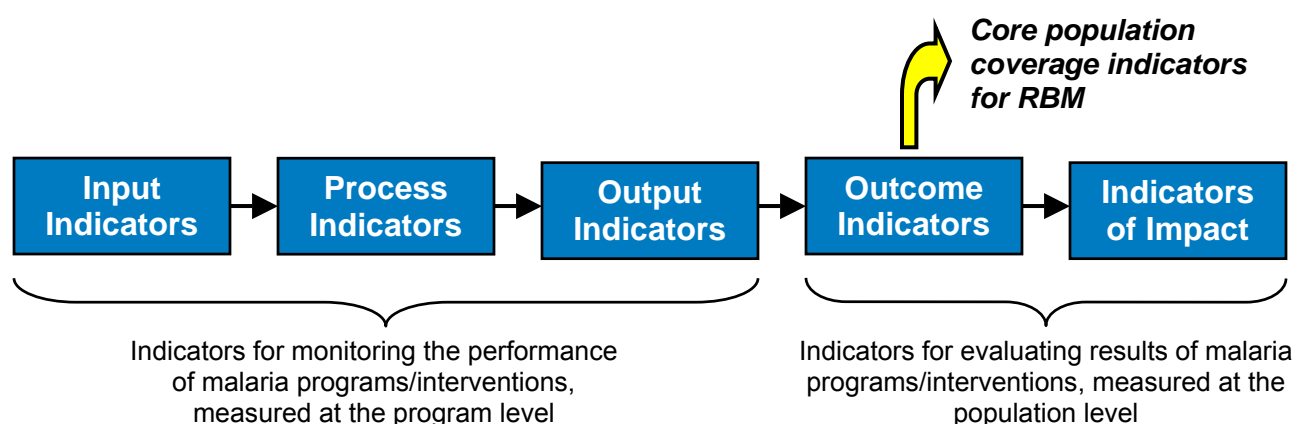
to measure benchmarks of program-level performance, such as the number of ITNs distributed to a particular target population. Figure 1 provides an example schematic of the level and function of indicators typically used for M&E.

While monitoring is a continuous process, formal evaluation is required to determine and document the extent to which any expectant results are attributable to a particular malaria control program, as measured through outcome and impact indicators. Outcome indicators are generally used to measure medium-term population-level results, such as the level of ITN coverage among a particular target population that can be attributed to an ITN program or intervention. It is expected that desired changes in outcomes will lead to a desired impact, which generally refers to the overall, long-term goals of a program or initiative, such as the RBM goal of halving malaria-related morbidity and mortality by 2010.

Please note that population-level changes for impact indicators are most often challenging to measure, and are very difficult to attribute to a particular program or intervention without the use of a rigorous experimental design. This is especially true of malaria in areas where the burden of disease is greatest. Current tools for measuring malaria mortality, such as verbal autopsy, are not specific or sensitive for attributing signs and symptoms to malaria. Other factors, such as treatment seeking behavior, and inconsistent and under-reporting of malaria events through national health information systems, may also limit the understanding of the overall impact of increased coverage of malaria interventions.

For these reasons, greater emphasis is needed in measuring changes in population-level coverage of the core RBM indicators at the outcome level. As there is a substantial amount of empirical evidence to support the efficacy of the RBM technical strategies, it is expected that increasing coverage of these key interventions will result in the desired reductions in malaria-related morbidity and mortality. Therefore, it is crucial that malarious countries implementing these interventions have clear definitions and adequate tools for measuring the pertinent outcome indicators for population-level coverage in order for the overall success of the RBM initiative to be assessed.

**Figure 1: Level and Function of M&E Indicators**





### 3. CORE INDICATORS OF POPULATION COVERAGE FOR EVALUATING PRIMARY RBM TECHNICAL STRATEGIES

There are five core RBM indicators that will be used to measure the proportion of the population that is covered by the interventions outlined by the RBM technical strategies, as outlined in Table 2. It is recognized that these five core indicators may not cover all ongoing malaria control activities, such as indoor residual house-spraying (IRS), which is ongoing within a select number of countries. Thus additional indicators, such as that for IRS, may need to be adopted by certain countries. Additionally, it is recognized that IPT is not an ongoing malaria control strategy outside of the African region, thus this indicator may not be pertinent to all RBM partner countries.

**Table 2: Indicators of Population Coverage for RBM Technical Strategies**

<b>RBM Technical Strategies</b>	<b>Indicator of Population Coverage</b>
Vector control via insecticide-treated nets (ITNs)	1. Proportion of households with at least one ITN.
	2. Proportion of children under 5 years old who slept under an ITN the previous night.
Prompt access to effective treatment	3. Proportion of children under 5 years old with fever in last 2 weeks who received antimalarial treatment according to national policy within 24 hours from onset of fever.
Prevention and control of malaria in pregnant women	4. Proportion of pregnant women who slept under an ITN the previous night.
	5. Proportion of women who received intermittent preventive treatment for malaria during their last pregnancy.

#### *Insecticide-treated Nets*

Under trial conditions, ITNs have been shown to reduce malaria transmission by as much as 90% [3], with concomitant reductions in malaria-related morbidity [4, 5]. Community randomized controlled trials have also shown ITNs to be associated with significant reductions in all-cause child mortality by as much as a third, across a range of malaria transmission settings in SSA [6, 7]. ITNs have also been shown to remain effective under field conditions, as it was shown that social marketing of ITN in Tanzania was associated with a 27% increase in survival, as well as 65% reduction in anemia, among children 1 month to 4 years old [8]. Efforts to scale up coverage of ITNs are underway in most African countries and are greatly assisted by efforts to remove associated taxes and tariffs on imported commodities [1].

#### *Prompt Access to Effective Treatment (among children under 5 years old)*

It is widely recognized that access to prompt and effective treatment is a key element in successful malaria control due to the rapid onset of illness and severe health outcomes related to *Plasmodium falciparum* malaria, especially among children and non-immune populations [1, 9]. However, antimalarial drug resistance has become a major challenge in providing an effective

malaria treatment within many regions of the world. Resistance to chloroquine, the cheapest and most widely available antimalarial drug, is now widespread across most of Africa. As a result, most countries in Africa have changed or are in the process of changing national antimalarial treatment policies. Understanding which antimalarial drugs are provided to children for fever and the promptness with which they are received after the onset of symptoms at the community level is an important component for monitoring prompt access to effective treatment.

### *Prevention and Control of Malaria in Pregnant Women*

Malaria infection during pregnancy is a major public health concern among adult populations across malaria endemic areas. Malaria during pregnancy can result in poor outcomes for the woman and her newborn, such as maternal anemia, low birth weight, and premature delivery [10]. Low birth weight is the single greatest risk factor for neonatal and a major contributor to infant mortality [11, 12]. This increased risk of adverse outcomes for mothers and their newborns is typically greatest for the mother's first two pregnancies. However, in the presence of HIV infection, the risk associated with placental malaria appears to be independent of the number of pregnancies [13]. Effective strategies for preventing and controlling malaria during pregnancy, such as the use of ITNs and IPT, have been shown to have a dramatic impact on the health of mothers and their newborns. ITN use has been shown to significantly reduce the prevalence of low birth weight deliveries, as well as malaria-related morbidity among pregnant women [1, 14]. At present, the standard IPT regimen is a therapeutic dose of sulphadoxine-pyrimethamine (SP) given at least twice after quickening to all pregnant women during routine antenatal care. IPT in two doses of SP during pregnancy has been shown to significantly reduce the prevalence of anemia and placental malaria infections at the time of delivery [15-17]. However, to achieve optimal benefit in settings with HIV prevalence in pregnant women of greater than 10%, it may likely be more cost effective to treat all women with a 3-dose regimen than to screen for HIV and provide this regimen only to HIV+ women [18].

## **3.1 MEASUREMENT TOOLS**

Nationally representative, population-based sample surveys are the principal measurement tools required to collect the necessary data for constructing all five core RBM indicators for population coverage. Many different forms of these surveys are currently being routinely implemented across much of SSA, however few of these surveys collect data on malaria-specific issues. Two large survey efforts that currently do collect data on malaria are the Demographic and Health Surveys (DHS) and the Multiple Indicator Cluster Surveys (MICS).

**Demographic and Health Surveys:** The DHS are nationally representative, population-based sample surveys that are routinely undertaken in many countries of SSA every 5 years, in order to collect data on a wide variety of demographic and health indicators. Importantly, the DHS surveys are designed to produce data that are comparable over time and among countries. The DHS includes a household register for the ascertainment of the age, sex, and relationship to the head of household for all individuals within selected households. The DHS surveys are typically designed to provide relatively precise population-level estimates by age groups, sex, urban/rural residence, and regions. The DHS survey package includes an optional module for malaria that allows the collection of all necessary data for the construction of these five core RBM indicators for population coverage.

**Multiple Indicator Cluster Surveys:** The MICS are nationally representative, population-based sample surveys developed by the United Nations Children Fund (UNICEF) and its partners. Initially designed to collect indicators marking progress towards the World Summit for Children goals, the MICS surveys have continued to be an important component of national data collection in many countries. The MICS surveys are conducted in rounds approximately every five years in some 70 countries. Importantly, the MICS are designed to produce data that are comparable over time and among countries. The MICS includes a household register for the ascertainment of the age, sex, and the relationship to the head of household for all individuals within selected households. The MICS includes a specific questionnaire module for assessing coverage of antimalarial treatment among febrile children and ITN use among all children. Currently, there is no module for malaria in pregnancy.

**Malaria Indicator Survey (MIS):** In addition to these on-going survey efforts, the RBM partners have developed standard MIS package for assessing the key household coverage indicators. This includes a core questionnaire and data tabulation plan, as well as related materials for organizing and conducting fieldwork. This stand-alone survey is designed to be implemented in a similar manner to the DHS, producing nationally representative, population-based data from which all five core RBM outcome indicators of population coverage can be constructed. The MIS will also produce a wide range of data for in-depth assessment of the malaria situation within countries. It is designed to be shorter, less expensive, and quicker to implement than many of the more comprehensive national survey efforts.

**‘Rider’ Questions on Other Surveys:** If a country cannot obtain data on the core indicators of population coverage through one of the methods discussed above, it may be possible to collect the required data through ‘rider’ questions, which are added on to other national-level survey efforts. The caveat in this situation is that every effort must be made to assure that the data collection methods meet the requirements for a nationally representative household survey. If data are collected using alternate or sub-national sampling procedures, the indicators calculated will not be compatible with those from national surveys. In addition to DHS and MICS, other surveys with potential for collecting malaria data at the national level include the World Bank’s Living Standards Measurement Surveys, the DHS AIDS Indicator Surveys, the World Health Organization’s (WHO) World Health Survey, the World Bank’s Core Welfare Indicators Surveys, national anemia surveys (usually conducted by Ministries of Health), NETMARK baseline surveys (USAID/Academy for Educational Development), RBM Baseline Surveys (WHO Afro), and commercial Omnibus Surveys. Some other possibilities are health examination surveys, income and expenditure surveys, and labor force surveys. Sample questions for collecting the relevant data necessary for the construction of the core indicators are outlined in the appendix. These questions may be added onto to any household sample surveys that are nationally representative.

## 3.2 METHOD OF MEASUREMENT AND DATA COLLECTION

There are several general issues pertaining to method of measurement and data collection that are relevant to all five core indicators for population coverage.

As stated, the data required for the construction of these indicators must be measured through nationally representative household sample surveys, such as the DHS, MICS, or MIS. If

questions for these indicators are to be added to other nationally representative sample surveys as a ‘rider’ module, there are two main components the survey must have in order to calculate all five indicators for population coverage: a household listing of all women of reproductive age and all children under 5 years of age who slept in household the night before the survey interview, and an individual questionnaire with women of reproductive age. Indicators pertaining to net use are derived from the household listing that allows the interviewer to ascertain which individuals slept under an ITN the previous night. The women’s questionnaire is used to ask about previous pregnancies and IPT use, as well as current pregnancy status (for ITN coverage in pregnancy). Information on treatment for children under 5 with fever can be obtained from the women’s questionnaire (questions about her own children) or in a separate questionnaire for caregivers of children.

To remain consistent with the Abuja targets, the core indicators for population coverage must also be measured among the population “at risk for malaria.” For countries where malaria is endemic throughout, this issue should not be of particular concern given that stratification by urban and rural residency is undertaken. However, within countries with widely varying levels of malaria endemicity, such as those with mountainous areas or deserts such as Kenya, aggregated areas without populations at risk from malaria must be identified so they may be excluded from these indicators.

Sampling procedures for collecting data on these five core indicators should be similar to those used by the DHS, MICS, or MIS. Such procedures generally entail multi-stage sampling, stratified by region, and by urban/rural residence. The first stage of such a multi-stage design entails the selection of clusters, or primary sampling units, from a list of enumeration areas. A sampling frame with complete enumeration of all clusters is typically ascertained from national census statistics. As these core indicators for population coverage must also be measured among only those at risk for malaria, districts, or other aggregated primary sampling units, without endemic or epidemic-prone malaria should be excluded from the sampling frame. However, within countries with endemic malaria throughout, all primary sampling units should be included in the sampling frame, given that pre-stratification by urban and rural residence is also undertaken. Survey-fieldworkers then list all households within selected clusters. Next, an equal number of households is typically selected for the sample in each of the selected clusters. For obtaining individual-level data, a complete enumeration of all individuals who slept in the household the previous night is obtained. An effort is then made to collect data on each of these individuals that comprise the target population to guard against selection bias. Standard statistical methods can then be used to produce estimates of the indicators at the national-level and/or within malaria endemic areas, as well as estimates of sampling errors and any design effect.

Sample surveys used to collect the data for all five indicators should be conducted with sufficient design and sample size to allow at a minimum, the comparisons among regions and urban/rural strata at the individual and household level within malaria-endemic areas. Due to the small number of currently pregnant women at any given time, a survey designed to collect these data should normally have an overall sample of  $\geq 5000$  women (in order to be comparable with the DHS, MICS, and MIS). If the household survey used for collecting data for these indicators does not specifically use a survey population defined as those at risk for malaria, care must be taken to ensure a sufficient sample size is obtained within malaria endemic areas of the country

so that desired levels of precision are obtained. It may also be necessary to oversample within certain districts with known levels of malaria transmission for comparison purposes and to aid with interpretation.

Specific notes on methodological issues are provided separately in Section 4 under the description of each indicator.

### 3.3 INTERPRETATION

There are two particular issues that will likely affect the interpretation of all five core indicators for population coverage.

The first issue of interpretation that applies to all five indicators is the recall bias of household respondents. Recall bias is the decrease in accuracy of reported data due to time lapse since occurrence. This may affect recall of mosquito net retreatment, the details of IPT during the last pregnancy, including the type of antimalarial given, and the treatment of a child with a fever within 2 weeks. In the last case, recall would be an issue for the reporting of fever within the last 2 weeks for children within the household, whether an antimalarial was given, how long after the onset of fever the treatment was given, as well as the type of antimalarial given. While recall bias creates difficulty for the overall interpretability of the actual point estimates of these indicators, this type of bias would likely not affect relative comparisons for evaluative purposes, as this type of bias may be nondifferential between different countries and across time.

The second issue that may affect the interpretation of the core indicators for population coverage is the heterogeneity of malaria transmission within countries. As such, national-level estimates of the indicators among the general population may be difficult to interpret. While this confounding likely affects the interpretation of all five indicators for population coverage, it is perhaps most easily illustrated with the indicator for household ITN possession. While a national-level estimate for household ITN possession is useful, it may say little about where ITN possession is concentrated with respect to the intensity of malaria transmission, without additional information. Stratifying by urban and rural residency would likely provide an adequate means of addressing this issue within most countries where malaria is for the most part endemic throughout. However, within countries with widely varying levels of malaria endemicity, such as Kenya, Ethiopia, and Eritrea, care must be taken to ensure only those populations at risk for malaria are included in the numerators and denominators for these indicators. Furthermore, in order to help with interpreting national-level estimates among at risk populations, it may also be necessary to oversample within sub-national areas, such as districts, with known levels of malaria transmission in order to ascertain relatively precise estimates for the core indicators within these areas.

At a minimum, the following basic demographic variables will need to be collected in order to assist with interpretation of the five core indicators for population coverage:

- Mother's level of education
- Age and sex of children under 5 years of age
- Region of residence

- Urban or rural residence
- Quality of housing (e.g., electricity, piped water, flush toilet, type of floor).

Notes on significant assumptions and potential bias are provided separately in Section 4 under the description of each indicator.

## 4. GUIDELINES FOR CONSTRUCTING EACH CORE RBM OUTCOME INDICATOR FOR POPULATION COVERAGE

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The final section of this manual provides a detailed description of how to construct each of the five core RBM outcome indicators used for measuring population coverage. They are organized according to the three primary RBM technical strategies previously outlined: ITNs, prompt access to effective treatment, and prevention and control of malaria in pregnant women. A detailed description is given for each indicator, including the details of the numerator and denominator, purpose, method of measurement, suggested questions, and specific issues of interpretation. Ideally, countries with an active malaria control program should report on all five of these core indicators on a regular basis. At a minimum, it is recommended that these indicators be measured every two to three years.

### 4.1 CORE POPULATION COVERAGE INDICATORS FOR MEASURING THE RBM TECHNICAL STRATEGY OF VECTOR CONTROL VIA ITNS

#### 1. Proportion of Households with at least One ITN

- **Numerator:** Number of households surveyed within malaria endemic areas with at least one mosquito net, which has been treated within and including 12 months or has been permanently treated.
- **Denominator:** Total number of households surveyed within malaria endemic areas.

#### *Purpose*

This indicator will be used to measure household ITN possession among the population at risk for malaria at the national level.

#### *Method of Measurement*

This indicator requires data collected at the household level from nationally representative sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. It is important that these data be collected on a household questionnaire, rather than on an individual questionnaire, as the individuals interviewed may not be representative of household possession. It is also important that surveys be conducted with sufficient design and sample size to allow comparisons among regions and urban/rural strata at the household level.



The numerator for this indicator is obtained from asking household respondent if there is any mosquito net in the house that can be used to avoid being bitten while sleeping, and from determining whether it has been treated within and including 12 months or has been permanently treated. The denominator is simply measured by the total number of surveyed households.

**Suggested Questions: 1.1–1.7 from malaria add-on household questions (Appendix).**

### *Interpretation*

This indicator provides a proxy measure for household ITN use at the national level among those at risk for malaria.

<b>Strengths</b>	<ul style="list-style-type: none"> <li>➤ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households.</li> <li>➤ Presence of a net can be verified at time of interview.</li> <li>➤ Various testing mechanisms may allow the interviewer to test whether the net has been recently treated with insecticide.</li> <li>➤ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.</li> </ul>
<b>Limitations</b>	<ul style="list-style-type: none"> <li>➤ Due to issues of date recall, this indicator may not provide reliable estimates of net retreatment status.</li> <li>➤ May be difficult to interpret at the national level as malaria transmission is most often localized.</li> <li>➤ May be biased by the seasonality of survey data collection, which is most often done during the dry season when reported net ownership may be lower.</li> <li>➤ No information is collected on whether the insecticide used to treat the net is an “approved” insecticide.</li> <li>➤ No information is collected on whether the net was washed after treatment, which can reduce its effectiveness.</li> </ul>

## **2. Proportion of Children Under 5 Years Old Who Slept Under an ITN the Previous Night**

- **Numerator:** Number of children under 5 years old at risk from malaria who slept under a mosquito net the previous night, which has been treated within and including 12 months or has been permanently treated.
- **Denominator:** Total number of children under 5 years old at risk for malaria who slept in surveyed households the previous night.

### *Purpose*

This indicator will be used to measure the level of ITN coverage of children under 5 years old who are at risk for malaria at the national level.

## Method of Measurement

This indicator requires data collected from nationally representative household sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. It is important that the survey contain a household listing that captures all children under 5 years old within each surveyed household. Such surveys should be conducted with sufficient design and sample size to allow comparisons among regions and urban/rural strata.

The data for the denominator are obtained from the household questionnaire that lists every child under 5 who slept in the house the previous night. The data for the numerator are then obtained from a listing of the same children in the house who slept under a mosquito net the previous night, in combination with information on whether the net had been treated with insecticide within and including 12 months or had been permanently treated.

**Suggested questions: 1.1–1.9 from malaria add-on household questions (Appendix).**

## Interpretation

This indicator provides a direct measure of ITN use by children under 5 years of age at risk for malaria at the national level.

<b>Strengths</b>	<ul style="list-style-type: none"><li>➤ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households.</li><li>➤ Presence of a net can be verified at time of interview.</li><li>➤ Various testing mechanisms may allow the interviewer to test whether the net has been recently treated with insecticide.</li><li>➤ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.</li></ul>
<b>Limitations</b>	<ul style="list-style-type: none"><li>➤ Due to issues of date recall, this indicator may not provide reliable estimates of net retreatment status.</li><li>➤ May be difficult to interpret at the national level as malaria transmission is most often localized.</li><li>➤ May be biased by the seasonality of survey data collection, which is most often done during the dry season when net use is likely at its lowest.</li><li>➤ No information is collected on whether the insecticide used to treat the net is an “approved” insecticide.</li><li>➤ No information is collected on whether the net was washed after treatment, which can reduce its effectiveness.</li></ul>



## 4.2 CORE POPULATION COVERAGE INDICATOR FOR MEASURING THE RBM TECHNICAL STRATEGY OF PROMPT ACCESS TO EFFECTIVE TREATMENT (AMONG CHILDREN UNDER 5 YEARS OLD)

### 3. Proportion of Children Under 5 Years Old with Fever in Last 2 Weeks Who Received Antimalarial Treatment According to National Policy Within 24 Hours from Onset of Fever

- **Numerator:** Number of children under 5 years old who had a fever in previous 2 weeks who received antimalarial treatment according to national policy <24 hours from onset of fever, within malaria endemic areas.
- **Denominator:** Total number of children under 5 years old who had a fever in previous 2 weeks, within malaria endemic areas.

#### *Purpose*

This indicator captures the national-level access to prompt and effective treatment for malaria within malaria endemic areas.

#### *Method of Measurement*

This indicator requires data collected from nationally representative household sample surveys within malaria endemic areas. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. If questions are to be added on as a ‘rider’ to a survey, it is important that the survey contain a household listing that captures all women of reproductive age and/or all children under 5 years old who slept within each surveyed household the previous night.

The data for the denominator are obtained in one of two ways, depending on the type of survey used. Some surveys use the household listing procedure when every child under 5 who slept in the house the previous night is identified (MICS). Other surveys ask questions in the women’s questionnaire about all their children under the age of 5, thus the denominator is the children of women of reproductive age. The numerator is then obtained from asking all mothers and/or caregivers (depending on survey method) in the household whether any of their children listed have had a fever in the past 2 weeks, and if so, if they were given an antimalarial treatment, and if so, how long after the onset of illness.

**Suggested questions: 3.1–3.6 from malaria add-on household questions (Appendix).**

#### *Interpretation*

This indicator provides a proxy measure for the level of access of children under 5 years old at risk for malaria to prompt and effective treatment for malaria infections, according to national guidelines, at the national level.

<b>Strengths</b>	<ul style="list-style-type: none"> <li>➤ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households.</li> <li>➤ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.</li> </ul>
<b>Limitations</b>	<ul style="list-style-type: none"> <li>➤ Due to issues of date recall, indicator may not provide reliable estimates of episodes of fever within previous 2 weeks, the length of time after onset of fever before an antimalarial drug was given, or the identity of which specific drug was given.</li> <li>➤ Fever may not have been due to a malaria infection.</li> <li>➤ There is no way of knowing if antimalarial treatments were administered correctly.</li> <li>➤ Data based solely on the mother's or caretaker's information may miss fostered children or others living in a household without a parent/caretaker.</li> <li>➤ May be difficult to compare across countries with different antimalarial drug policies.</li> </ul>

### 4.3 CORE POPULATION COVERAGE INDICATOR FOR MEASURING THE RBM TECHNICAL STRATEGY OF PREVENTION AND CONTROL AMONG PREGNANT WOMEN

#### 4. Proportion of Pregnant Women Who Slept Under an ITN the Previous Night

- **Numerator:** Number of pregnant women at risk for malaria who slept under a mosquito net the previous night, which has been treated within and including 12 months or has been permanently treated.
- **Denominator:** Total number of pregnant women who reside within surveyed households within malaria endemic areas.

#### *Purpose*

This indicator will be used to measure the level of ITN use by pregnant women at risk for malaria at the national level.

#### *Method of Measurement*

This indicator requires data collected from nationally representative household sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. Due to small number of currently pregnant women at any given time, a survey designed to collect these data should have an overall sample of  $\geq 5000$  women (in order to be comparable with MICS and DHS). If questions are to be added on as a 'rider' to a survey, it is important that the survey contain a household listing that captures all women of reproductive age within each surveyed household. Such surveys should be conducted with sufficient design and sample size to allow comparisons among regions and urban/rural strata at the individual level.

The data for the denominator are obtained from a series of questions asked of all women of reproductive age in the household about their current pregnancy status. The data for the numerator are then obtained from a listing of these women that slept under a mosquito net the previous night, in combination with information on current pregnancy status and whether the net had been treated with insecticide within and including 12 months or had been permanently treated.

**Suggested questions: 1.1–1.9, and 2.1 from malaria add-on household questions (Appendix).**

### *Interpretation*

This indicator provides a direct measure of ITN use by pregnant women at risk for malaria at the national level.

<b>Strengths</b>	<ul style="list-style-type: none"> <li>➤ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households.</li> <li>➤ Presence of a net can be verified at time of interview.</li> <li>➤ Various testing mechanisms may allow the interviewer to test whether the net has been recently treated with insecticide.</li> <li>➤ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.</li> </ul>
<b>Limitations</b>	<ul style="list-style-type: none"> <li>➤ Difficult to capture all pregnant women in a household survey because many women either don't know they are pregnant or do not want to divulge this information.</li> <li>➤ Large sample size required to obtain precise estimates.</li> <li>➤ May be some bias if reluctance to discuss pregnancy is also associated with first births, adolescents, and other demographic factors.</li> <li>➤ May be misleading at the national level as malaria transmission is most often localized.</li> <li>➤ May not provide reliable estimates of net retreatment status due to poor date recall.</li> <li>➤ May be biased by the seasonality of survey data collection, which is most often done during the dry season when net use is likely at its lowest.</li> </ul>

## **5. Proportion of Women Who Received Intermittent Preventive Treatment for Malaria During Their Last Pregnancy**

- **Numerator:** Number of women at risk for malaria who took an antimalarial drug treatment to prevent malaria during their last pregnancy that led to a live birth within the last 5 years.
- **Denominator:** Total number of women surveyed at risk for malaria who delivered a live baby within the last 5 years

### *Purpose*

This indicator will be used to measure the national-level use of IPT to prevent malaria during pregnancy among women at risk for malaria.

## Method of Measurement

This indicator requires data collected from nationally representative household sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. If questions are to be added on as a ‘rider’ to a survey, it is important that the survey contain a household listing that captures all women of reproductive age within each surveyed household, as well as a female questionnaire to collect data on previous births and antenatal care. Additionally, due to the limited number of women who delivered a live baby within the previous 5 years, care should be taken to ensure such surveys are conducted with sufficient sample size and designed to allow comparisons among regions and urban/rural strata at the individual level.

Data from the women’s questionnaires for all women who delivered a live baby within the last 5 years within surveyed household is used to calculate the denominator. The numerator is derived from the number of women who mention taking an antimalarial for prevention (NOT treatment) during their most recent pregnancy (from among all listed births to women in the last 5 years).

It is important to differentiate between a treatment dose for prevention (as prescribed for IPT) and actual treatment of an existing malaria infection. Although it is extremely difficult to differentiate in the context of a survey interview, the latter is curative care, and does not count as standard IPT procedure. Similarly, women taking weekly chloroquine prophylaxis are not considered to be covered by IPT.

**Suggested questions: 2.1–2.7 from malaria add-on household questions (Appendix).**

## Interpretation

This indicator provides a proxy measure for the proportion of pregnant women at risk for malaria who receive IPT during pregnancy, at the national level.

<b>Strengths</b>	<ul style="list-style-type: none"><li>➤ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households.</li><li>➤ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.</li><li>➤ Data collected from a national-level survey gives a more accurate perspective on coverage of IPT interventions than data obtained through routine facility-based information systems.</li></ul>
<b>Limitations</b>	<ul style="list-style-type: none"><li>➤ Retrospective questions about IPT given during previous pregnancy may be subject to recall bias.</li><li>➤ Difficult to determine at what stage during pregnancy IPT was given.</li><li>➤ May be misleading at the national level as malaria transmission is most often localized.</li><li>➤ May not provide reliable estimates for what type of antimalarial was given due to poor recall.</li></ul>



## REFERENCES

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1. World Health Organization. 2003. *The Africa malaria report 2003*. Geneva: World Health Organization/UNICEF.
2. World Health Organization. 2003. *Malaria: Fact sheet no. 94*. <<http://www.who.int/mediacentre/factsheets/fs094/en>>.
3. Gimnig, J. E., et al. 2003. Impact of permethrin-treated bednets on entomological indices in an area of intense year-round malaria transmission. *American Journal of Tropical Medicine and Hygiene*, 68(Suppl. 4), 16–22.
4. D'Alessandro, U., et al. 1995. Mortality and morbidity from malaria in Gambian children after introduction of an impregnated bednet programme. *Lancet*, 345(8948), 479–483.
5. ter Kuile, F. O., et al. 2003. Impact of permethrin-treated bednets on malaria and all-cause morbidity in young children in an area of intense perennial malaria transmission in western Kenya: Cross-sectional survey. *American Journal of Tropical Medicine and Hygiene*, 68(Suppl. 4), 100–107.
6. Lengeler, C. 2000. Insecticide-treated bednets and curtains for preventing malaria. *Cochrane Database of Systematic Reviews*, (2), CD000363.
7. Phillip-Howard, P. A., et al. 2003. Efficacy of permethrin-treated bednets in the prevention of mortality in young children in an area of high perennial malaria transmission in western Kenya. *American Journal of Tropical Medicine and Hygiene*, 68(Suppl. 4), 23–29.
8. Schellenberg, J. R., et al. 2001. Effect of large-scale social marketing of insecticide-treated nets on child survival in rural Tanzania. *Lancet*, 357(9264), 1241–1247.
9. Greenwood, B. M., et al. 1987. Mortality and morbidity from malaria among children in a rural area of The Gambia, West Africa. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 81(3), 478–486.
10. Shulman, C. E., and E. K. Dorman. 2003. Importance and prevention of malaria in pregnancy. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 97(1), 30–55.
11. McCormick, M. C. 1985. The contribution of low birth weight to infant mortality and childhood morbidity. *New England Journal of Medicine*, 312(2), 82–90.
12. Steketee, R. W., et al. 2001. The burden of malaria in pregnancy in malaria-endemic areas. *American Journal of Tropical Medicine and Hygiene*, 64(Suppl. 1–2), 28–35.
13. van Eijk, A. M., et al. 2003. HIV increases the risk of malaria in women of all gravidities in Kisumu, Kenya. *AIDS*, 17(4), 595–603.
14. ter Kuile, F. O., et al. 2003. Reduction of malaria during pregnancy by permethrin-treated bednets in an area of intense perennial malaria transmission in western Kenya. *American Journal of Tropical Medicine and Hygiene*, 68(Suppl. 4), 50–60.

15. Steketee, R. W. 2002. Malaria prevention in pregnancy: When will the prevention programme respond to the science. *Journal of Health, Population, and Nutrition*, 20(1), 1–3.
16. Shulman, C. E., et al. 1999. Intermittent sulphadoxine-pyrimethamine to prevent severe anaemia secondary to malaria in pregnancy: A randomized placebo-controlled trial. *Lancet*, 353(9153), 632–636.
17. Schultz, L. J., et al. 1994. The efficacy of antimalarial regimens containing sulfadoxine-pyrimethamine and/or chloroquine in preventing peripheral and placental *Plasmodium falciparum* infection among pregnant women in Malawi. *American Journal of Tropical Medicine and Hygiene*, 51(5), 515–522.
18. Wolfe, E. B., et al. 2001. Cost-effectiveness of sulfadoxine-pyrimethamine for the prevention of malaria-associated low birth weight. *American Journal of Tropical Medicine and Hygiene*, 64(3–4), 178–186.

## APPENDIX: ADD-ON HOUSEHOLD QUESTIONS FOR MEASURING CORE INDICATORS FOR POPULATION COVERAGE

This appendix contains suggested questions for ascertaining the necessary data for constructing the five core RBM outcome indicators for measuring population coverage. These questions are intended to be added on to on-going household surveys that contain both a household schedule and a women's questionnaire. The household schedule is used for registering the age, sex, and relationship of all individuals who usually reside in the house or visitors who stayed in the house the previous night. An example of such a household schedule is provided below. Mosquito net possession, retreatment status of the net(s), as well as a listing of all individuals within the house who slept under the net(s) the previous night are obtained from the household respondent. The women's questionnaire should target all women of reproductive age (15-49 years old) listed within the household schedule. Each woman is asked information on: 1) their current pregnancy status; 2) IPT during their most recent pregnancy that resulted in a live birth; 3) whether any of their children (as listed on the household schedule) have had any fever within the previous 2 weeks; and 4) whether such illnesses were treated with antimalarials, including how long after illness. Data on fever treatment in children under five can be obtained either through the women's questionnaire, if questions are asked about her own children, or through a separate care-giver module for individuals caring for young children. If there is no household schedule within the sample survey such that all relevant information is to be obtained from a single household representative, these questions will require some modification.

### Household Schedule

Now we would like some information about the people who usually live in your household or who are staying with you now (to be asked to the household respondent).

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBLE WOMEN	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household? <i>*Codes not provided here</i>	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	FOR ELIGIBLE WOMEN, ASK: Is (NAME) currently pregnant?
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			M    F	YES   NO	YES   NO	IN YEARS		YES   NO/DK
01		<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div>	1    2	1    2	1    2	<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div>	01	1    2
02		<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div>	1    2	1    2	1    2	<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div>	02	1    2
03		<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div>	1    2	1    2	1    2	<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block;"></div>	03	1    2

This is only an example and should include spaces for additional household residents

\*Please see the MIS for listing of codes for Q.3.



## Section 1: Household Net Ownership

To be asked to the household respondent.

1.1	Does your household have any mosquito nets that can be used while sleeping?	YES ..... 1 NO ..... 2	→ Skip to Q.2.1	
1.2	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE(S).	NET # 1	NET #2	NET #3
		OBSERVED ..... 1	OBSERVED ..... 1	OBSERVED ..... 1
		NOT OBSERVED ..... 2	NOT OBSERVED ..... 2	NOT OBSERVED ..... 2
1.3	How long ago did your household obtain the mosquito net?  IF LESS THAN 1 MONTH, RECORD '00'.	MOS AGO <table border="1" style="display: inline-table; width: 40px; height: 20px; vertical-align: middle;"></table>  MORE THAN 2 YEARS AGO ..... 95	MOS AGO <table border="1" style="display: inline-table; width: 40px; height: 20px; vertical-align: middle;"></table>  MORE THAN 2 YEARS AGO ..... 95	MOS AGO <table border="1" style="display: inline-table; width: 40px; height: 20px; vertical-align: middle;"></table>  MORE THAN 2 YEARS AGO ..... 95
1.4	OBSERVE OR ASK THE BRAND OF MOSQUITO NET.  *THE CODING FOR THIS QUESTION SHOULD BE COUNTRY SPECIFIC.  <u>BRANDS</u> A: B: C: D: E: F:	'PERMANENT' NET <sup>1</sup> BRAND A ..... 11 BRAND B ..... 12 DK BRAND ..... 18 (SKIP TO 1.8) ←  'PRETREATED' NET <sup>2</sup> BRAND C ..... 21 BRAND D ..... 22 DK BRAND ..... 28 (SKIP TO 1.6) ←  OTHER BRAND E ..... 31 BRAND F ..... 32 DK BRAND ..... 38  NOT SURE ..... 98	'PERMANENT' NET <sup>1</sup> BRAND A ..... 11 BRAND B ..... 12 DK BRAND ..... 18 (SKIP TO 1.8) ←  'PRETREATED' NET <sup>2</sup> BRAND C ..... 21 BRAND D ..... 22 DK BRAND ..... 28 (SKIP TO 1.6) ←  OTHER BRAND E ..... 31 BRAND F ..... 32 DK BRAND ..... 38  NOT SURE ..... 98	'PERMANENT' NET <sup>1</sup> BRAND A ..... 11 BRAND B ..... 12 DK BRAND ..... 18 (SKIP TO 1.8) ←  'PRETREATED' NET <sup>2</sup> BRAND C ..... 21 BRAND D ..... 22 DK BRAND ..... 28 (SKIP TO 1.6) ←  OTHER BRAND E ..... 31 BRAND F ..... 32 DK BRAND ..... 38  NOT SURE ..... 98
1.5	When you got the net, was it already treated with an insecticide to kill or repel mosquitoes?	YES ..... 1 NO ..... 2 NOT SURE ..... 8	YES ..... 1 NO ..... 2 NOT SURE ..... 8	YES ..... 1 NO ..... 2 NOT SURE ..... 8
1.6	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes or bugs?	YES ..... 1 NO ..... 2 NOT SURE ..... 8 (SKIP TO 1.8) ←	YES ..... 1 NO ..... 2 NOT SURE ..... 8 (SKIP TO 1.8) ←	YES ..... 1 NO ..... 2 NOT SURE ..... 8 (SKIP TO 1.8) ←
1.7	How long ago was the net last soaked or dipped?  IF LESS THAN 1 MONTH, RECORD '00'.	MOS AGO <table border="1" style="display: inline-table; width: 40px; height: 20px; vertical-align: middle;"></table>  MORE THAN 24 MONTHS AGO ..... 95 NOT SURE ..... 98	MOS AGO <table border="1" style="display: inline-table; width: 40px; height: 20px; vertical-align: middle;"></table>  MORE THAN 24 MONTHS AGO ..... 95 NOT SURE ..... 98	MOS AGO <table border="1" style="display: inline-table; width: 40px; height: 20px; vertical-align: middle;"></table>  MORE THAN 24 MONTHS AGO ..... 95 NOT SURE ..... 98
1.8	Did anyone sleep under this mosquito net last night?	YES ..... 1 NO ..... 2 NOT SURE ..... 8 (SKIP TO 2.1) ←	YES ..... 1 NO ..... 2 NOT SURE ..... 8 (SKIP TO 2.1) ←	YES ..... 1 NO ..... 2 NOT SURE ..... 8 (SKIP TO 2.1) ←

1.9	Who slept under this mosquito net last night?  RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME _____	NAME _____	NAME _____						
		LINE NO. <table border="1"><tr><td></td><td></td></tr></table>			LINE NO. <table border="1"><tr><td></td><td></td></tr></table>			LINE NO. <table border="1"><tr><td></td><td></td></tr></table>		
NAME _____	NAME _____	NAME _____								
LINE NO. <table border="1"><tr><td></td><td></td></tr></table>			LINE NO. <table border="1"><tr><td></td><td></td></tr></table>			LINE NO. <table border="1"><tr><td></td><td></td></tr></table>				
NAME _____	NAME _____	NAME _____								
LINE NO. <table border="1"><tr><td></td><td></td></tr></table>			LINE NO. <table border="1"><tr><td></td><td></td></tr></table>			LINE NO. <table border="1"><tr><td></td><td></td></tr></table>				

<sup>1</sup> "Permanent" is a pretreated net that does not require any further treatment.

<sup>2</sup> "Pretreated" is a net that has been pretreated, but requires further treatment after 6–12 months.

## Section 2: Pregnancy and Intermittent Preventive Treatment

To be asked to each woman of reproductive age (15–49 years old) listed on the household schedule.

2.1	Are you pregnant now?	YES.....1 NO.....2 UNSURE.....8	
2.2	CHECK PREVIOUS QUESTION FROM WOMAN'S QUESTIONNAIRE, ASKING ABOUT THE TIMING OF THE MOST RECENT BIRTH:  ONE OR MORE BIRTHS IN LAST 5 YEARS <input type="checkbox"/> NO BIRTHS IN LAST 5 YEARS <input type="checkbox"/>		→ Skip to Q.3.1
2.3	ENTER THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF THE MOST RECENT BIRTH (within last 5 years).  Now I would like to ask you some questions about your last pregnancy that ended in a live birth.	LAST BIRTH LINE NUMBER..... <input type="text"/> <input type="text"/> NAME _____  LIVING <input type="checkbox"/> DEAD <input type="checkbox"/> ↓ ↓	
2.4	When you were pregnant with (NAME OF LAST BIRTH), did you take any drugs in order to prevent you from getting malaria?	YES.....1 NO .....2 DON'T KNOW.....8	→ Skip to Q.3.1
2.5	Which drugs did you take to prevent malaria?  RECORD ALL MENTIONED.  IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR..... A CHLOROQUINE..... B OTHER _____ X (SPECIFY) DON'T KNOW..... Z	
2.6	CHECK 2.5:  DRUGS TAKEN FOR MALARIA PREVENTION	CODE "A" CIRCLED <input type="checkbox"/> CODE "A" NOT CIRCLED <input type="checkbox"/>	→ Skip to Q.3.1
2.7	How many times did you take SP/Fansidar during this pregnancy?	TIMES..... <input type="text"/> <input type="text"/>	

### Section 3: Fever in Children

To be asked to each woman of reproductive age (15–49 years old) listed on the household schedule, or to the caregivers of all children under 5 depending on the type of survey method used.

3.1	CHECK PREVIOUS QUESTION FROM WOMAN'S QUESTIONNAIRE ASKING ABOUT THE TIMING OF THE MOST RECENT BIRTH:		
	ONE OR MORE BIRTHS IN LAST 5 YEARS <input type="checkbox"/>	NO BIRTHS IN LAST 5 YEARS <input type="checkbox"/>	→ Skip to end
3.2	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD UNDER 5 YEARS OLD. (IF THERE ARE MORE THAN 2 CHILDREN UNDER 5 YEARS OLD, USE ADDITIONAL QUESTIONNAIRES).  Now I would like to ask you some questions about the health of your children less than 5 years old. (We will talk about each one separately.)	YOUNGEST CHILD LINE NUMBER ..... <input type="text"/> <input type="text"/>  NAME .....	NEXT-TO-YOUNGEST CHILD LINE NUMBER ..... <input type="text"/> <input type="text"/>  NAME .....
3.3	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8  (IF 2 OR 8, GO BACK TO 3.2 FOR NEXT CHILD, OR IF NO OTHER CHILDREN UNDER FIVE, SKIP TO END)	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8  (IF 2 OR 8, GO BACK TO 3.2 IN FIRST COLUMN OF NEW QUESTIONNAIRE, IF NO OTHER CHILDREN UNDER FIVE, SKIP TO END)
3.4	Did (NAME) take any drugs for the (fever)?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (SKIP TO NEXT CHILD OR TO END) ←	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (SKIP TO NEXT CHILD OR TO END) ←
3.5	What drugs did (NAME) take? <sup>1</sup>  RECORD ALL MENTIONED.  ASK TO SEE DRUG(S) IF TYPE OF DRUG IS NOT KNOWN. IF TYPE OF DRUG IS STILL NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	ANTI-MALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D OTHER ANTIMALARIAL ..... E  (SPECIFY) _____  OTHER DRUGS ASPIRIN ..... F IBUPROFEN ..... G ACETAMINOPHEN ..... H  OTHER ..... X (SPECIFY) _____ DON'T KNOW ..... Z	ANTI-MALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D OTHER ANTIMALARIAL ..... E  (SPECIFY) _____  OTHER DRUGS ASPIRIN ..... F IBUPROFEN ..... G ACETAMINOPHEN ..... H  OTHER ..... X (SPECIFY) _____ DON'T KNOW ..... Z
3.6	How long after the fever started did (NAME) first take (NAME OF DRUG FROM Q.3.5)? IF MULTIPLE DRUGS LISTED IN 3.5, NAME ALL DRUGS MENTIONED.	SAME DAY ..... 0 NEXT DAY ..... 1 2 DAYS AFTER THE FEVER ..... 2 3 DAYS AFTER THE FEVER ..... 3 4 OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW ..... 8	SAME DAY ..... 0 NEXT DAY ..... 1 2 DAYS AFTER THE FEVER ..... 2 3 DAYS AFTER THE FEVER ..... 3 4 OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW ..... 8

<sup>1</sup> Revise list of drugs as appropriate; however, the broad categories must be maintained.

